

CLAIMS

What is claimed is:

1. A method for actuating a remote device having a receiver using an RF transmitter in a vehicle to transmit variable code signals, the RF transmitter including a memory having variable code characteristics associated with a plurality of different remote devices, the method comprising:

initiating an operating sequence to actuate the remote device;
generating a plurality of RF carrier signals, each RF carrier signal including variable code characteristics associated with a different remote device from the plurality of different remote devices; and

transmitting the plurality of RF carrier signals to the receiver of the remote device in order to remotely actuate the remote device.

2. A method according to claim 1, wherein the plurality of RF carrier signals are transmitted sequentially to the receiver of the remote device.

3. A method according to claim 1, wherein the plurality of RF carrier signals are transmitted simultaneously to the receiver of the remote device.

4. A method according to claim 3, wherein the RF transmitter includes a plurality of transmitter circuits.

5. A method according to claim 3, wherein the plurality of RF carrier signals include packets of data that are transmitted simultaneously in a single interleaved transmission.

6. A method according to claim 1, wherein the variable code characteristics include manufacturer, make, model, carrier frequency, cryptographic algorithm and encryption data.

7. A method according to claim 1, wherein the plurality of RF carrier signals are generated and transmitted at each initiation of the operating sequence.

8. A method for training a trainable RF transmitter in a vehicle to transmit variable code signals used to actuate a remote device having a receiver, the trainable transmitter having a memory including stored variable code characteristics for a plurality of different remote devices, the method comprising:

initiating a training sequence;
generating at least one RF carrier signal having variable code characteristics associated with one remote device from the plurality of different remote devices;

transmitting the at least one RF carrier signal to the receiver of the remote device;

repeating the generating and transmitting steps for the variable code characteristics of each remote device in the plurality of different remote devices until feedback is received from a user that the remote device is activated; and

upon receiving an indication that the remote device is activated, storing an identifier of the variable code characteristics that activated the remote device.

9. A method according to claim 8, further comprising associating the identified variable code characteristics with a user input device of the trainable transmitter for subsequent transmission of an RF carrier signal to actuate the remote device.

10. A method according to claim 8, wherein the variable code characteristics include manufacturer, make, model, carrier frequency, cryptographic algorithm, and encryption data.

11. A method according to claim 8, wherein the step of generating at least one RF carrier signal includes generating a plurality of RF carrier signals that correspond to a subset of the plurality of different remote devices where each RF carrier signal has the variable code characteristics of one of the remote devices in the subset of the plurality of different remote devices.

12. A method according to claim 11, wherein the generating and transmitting steps are repeated for a different subset of the plurality of different remote devices until feedback is received from the user indicating that the remote device was activated by the plurality of RF carrier signals.

13. A method according to claim 12, further including storing an identifier for the subset of devices associated with the plurality of RF signals that activated the remote device.

14. A method according to claim 1, further comprising associating the identified subset of devices with a user input device of the trainable transmitter for subsequent transmission of RF carrier signals to actuate the remote device.

15. A method for training a trainable RF transmitter in a vehicle to transmit variable code signals used to actuate remote devices, the trainable transmitter including a memory having stored variable code characteristics for a plurality of different remote devices, the method comprising:

receiving inputs from a user;

identifying a remote device to be actuated from the plurality of different remote devices based on the received inputs; and

associating the identified remote device with a user input device of the trainable transmitter for subsequent transmission of a variable code signal having variable code characteristics of the identified remote device to actuate the identified remote device.

16. A method according to claim 15, wherein the user input device is configured to receive the input from the user.

17. A method according to claim 16, wherein the user input device includes at least one pushbutton.

18. A method according to claim 15, wherein the inputs received from the user identify characteristics of the remote device.

19. A method according to claim 15, wherein the trainable transmitter is coupled to a display and the display presents a menu of data related to the plurality of different remote devices.

20. A method according to claim 15, wherein the variable code characteristics include manufacturer, make, model, carrier frequency, cryptographic algorithm and encryption data.

21. A method for training a trainable RF transmitter in a vehicle to transmit variable code signals used to actuate remote devices, the trainable transmitter including a memory having stored variable code characteristics for a plurality of different remote devices, the method comprising:

receiving inputs from a user;

identifying a remote device to be actuated from the plurality of different remote devices based on the received inputs;

generating an RF carrier signal having variable code characteristics of the identified remote device; and

transmitting the RF carrier signal to a receiver of the identified remote device to actuate the identified remote device.

22. A method according to claim 21, further comprising:

receiving feed back from a user that the identified remote device is actuated; and

associating the identified remote device with a user input device of the trainable transmitter for subsequent transmission of a variable code signal having

variable code characteristics of the identified remote device to actuate the identified remote device.

23. A trainable transmitter in a vehicle for transmitting variable code signals used to actuate remote devices, the trainable transmitter comprising:

a memory having stored variable code characteristics for a plurality of different remote devices;

a user input device configured to receive inputs from a user;

a control circuit coupled to the user input device and the memory and configured to receive the inputs from the user input device, to identify a remote device from the plurality of different remote devices based on the received inputs and to associate the identified remote device with the user input device for subsequent transmission of a variable code signal having variable code characteristics of the identified remote device; and

a transmitter circuit coupled to the control circuit and configured to transmit the variable code signal to actuate the identified remote device.

24. A trainable transmitter according to claim 23, wherein the user input device includes at least one pushbutton.

25. A trainable transmitter according to claim 23, wherein the trainable transmitter is mounted in a visor of the vehicle.

26. A trainable transmitter according to claim 23, wherein the trainable transmitter is mounted in an overhead console.